

Enhanced SCIT

Briefing for the TAC

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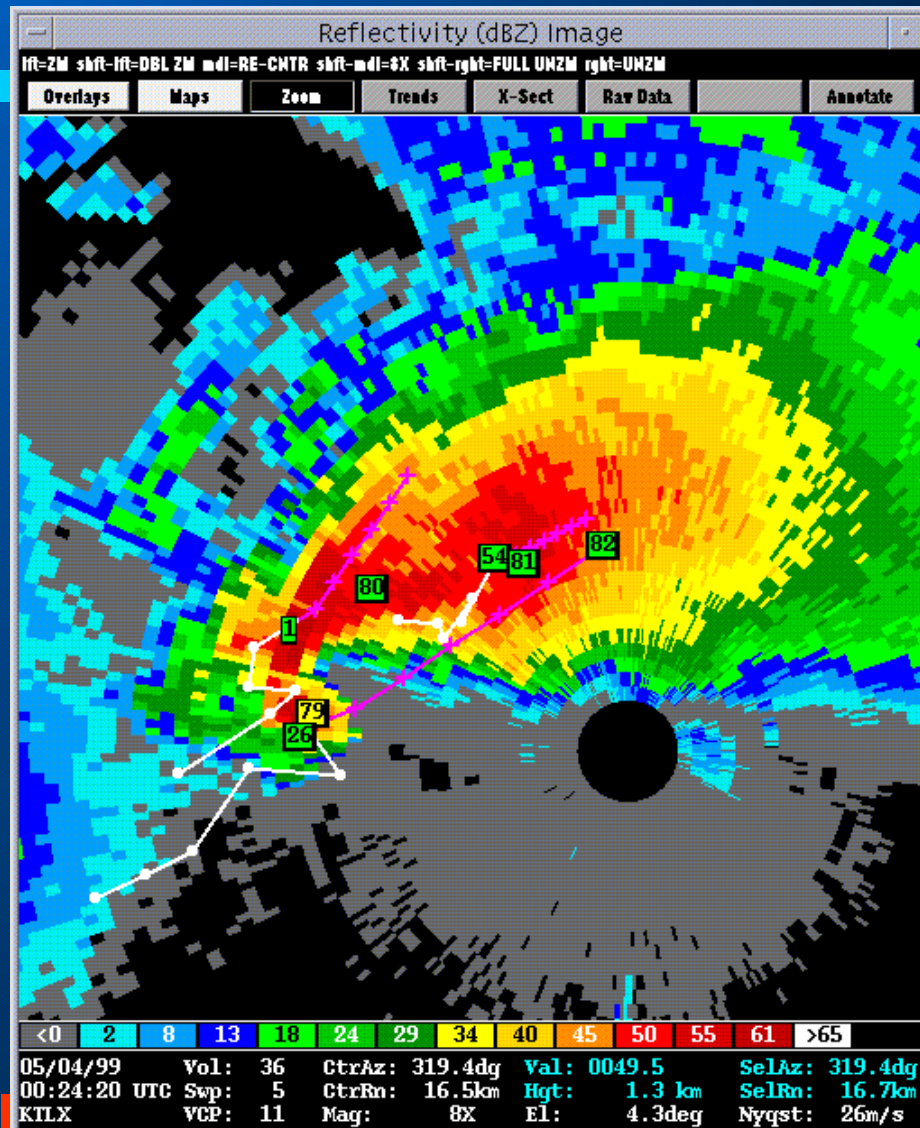
Current WSR-88D SCIT

- Identifies 3D “storms” by vertically-associating 2D “components” at adjacent elevation angles based on spatial proximity
- Merges 3D storms if there is no vertical overlap and the vertical gap is < 4 km

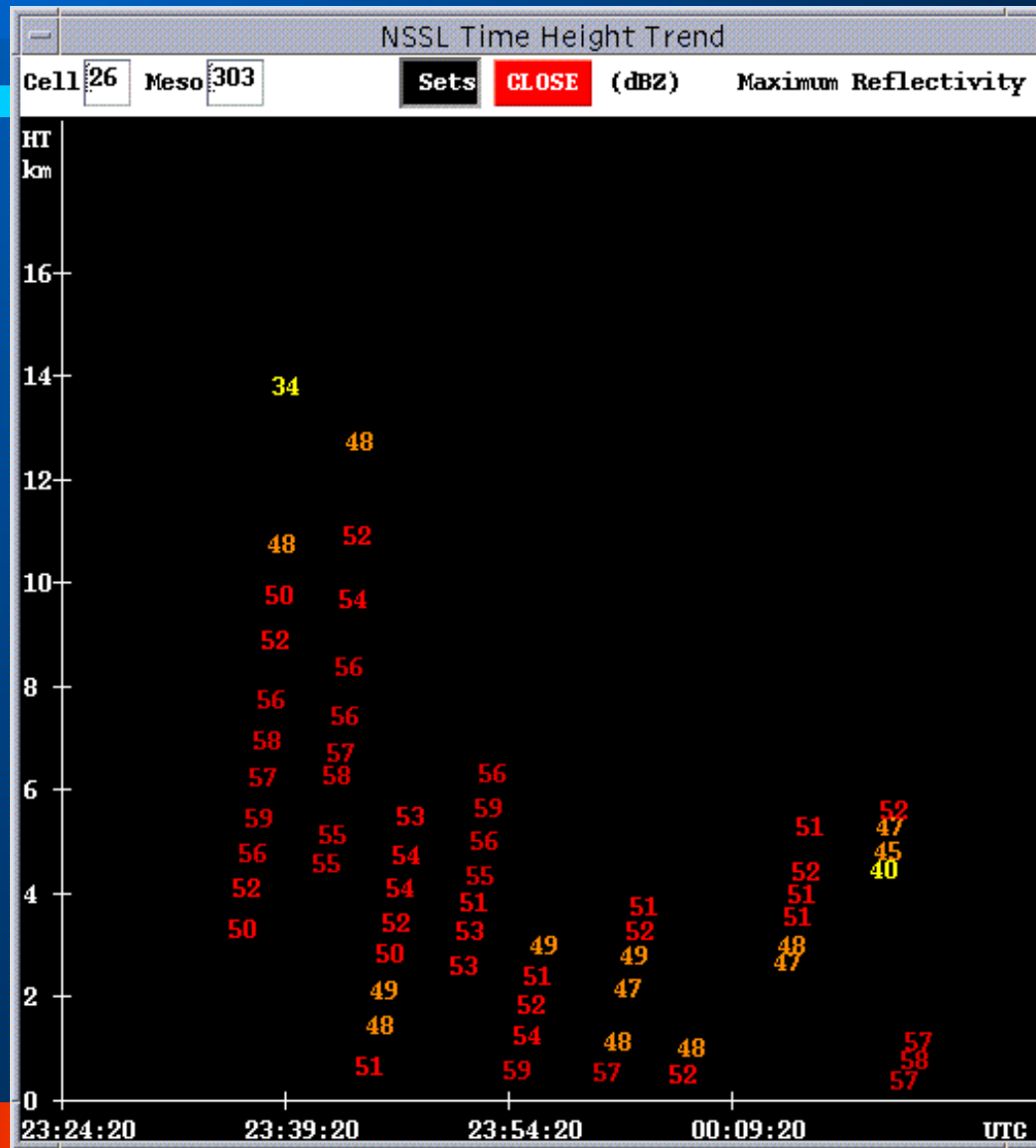
Current WSR-88D SCIT

- Is good at identifying individual cells
- For multicell storms, including supercells, there are often multiple 3D detections
- In larger storms, the main core is often “fragmented” into 2 or more 3D detections

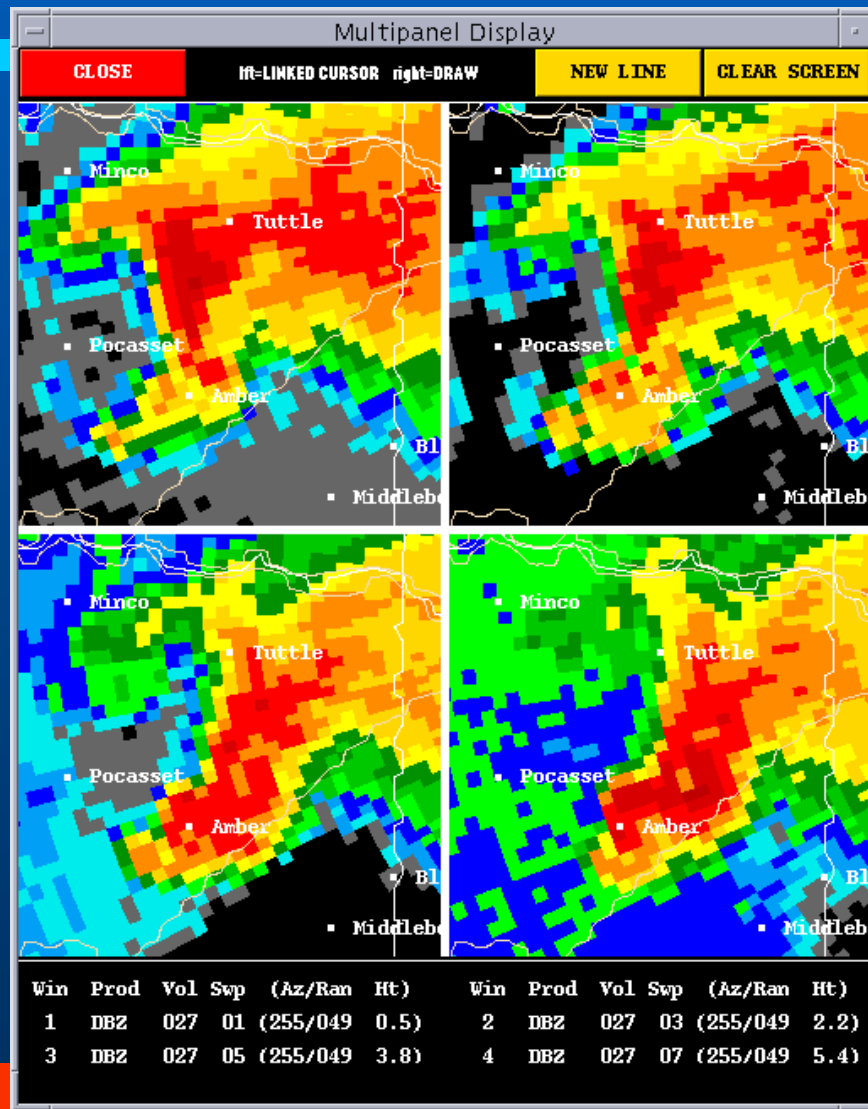
Example of storm “fragmentation”



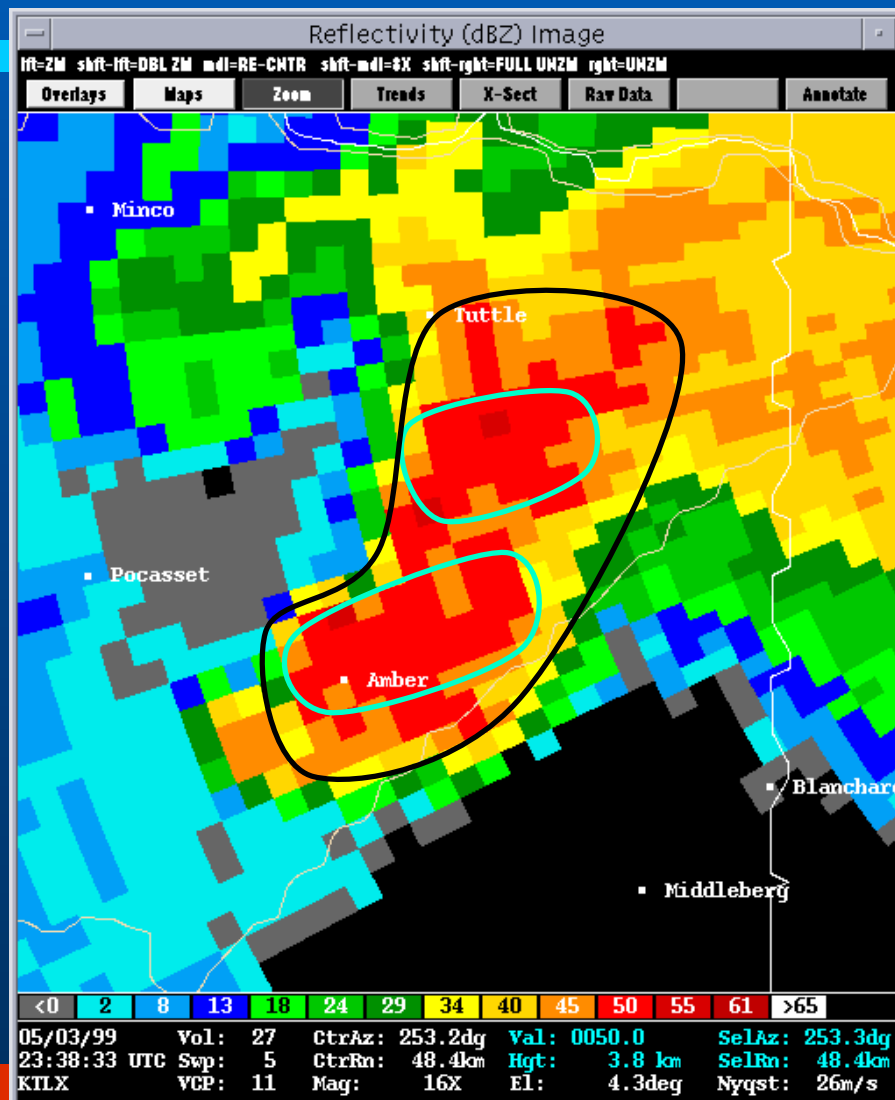
Poor trends due to storm “fragmentation”



KTLX 3 May 1999 - Storm A



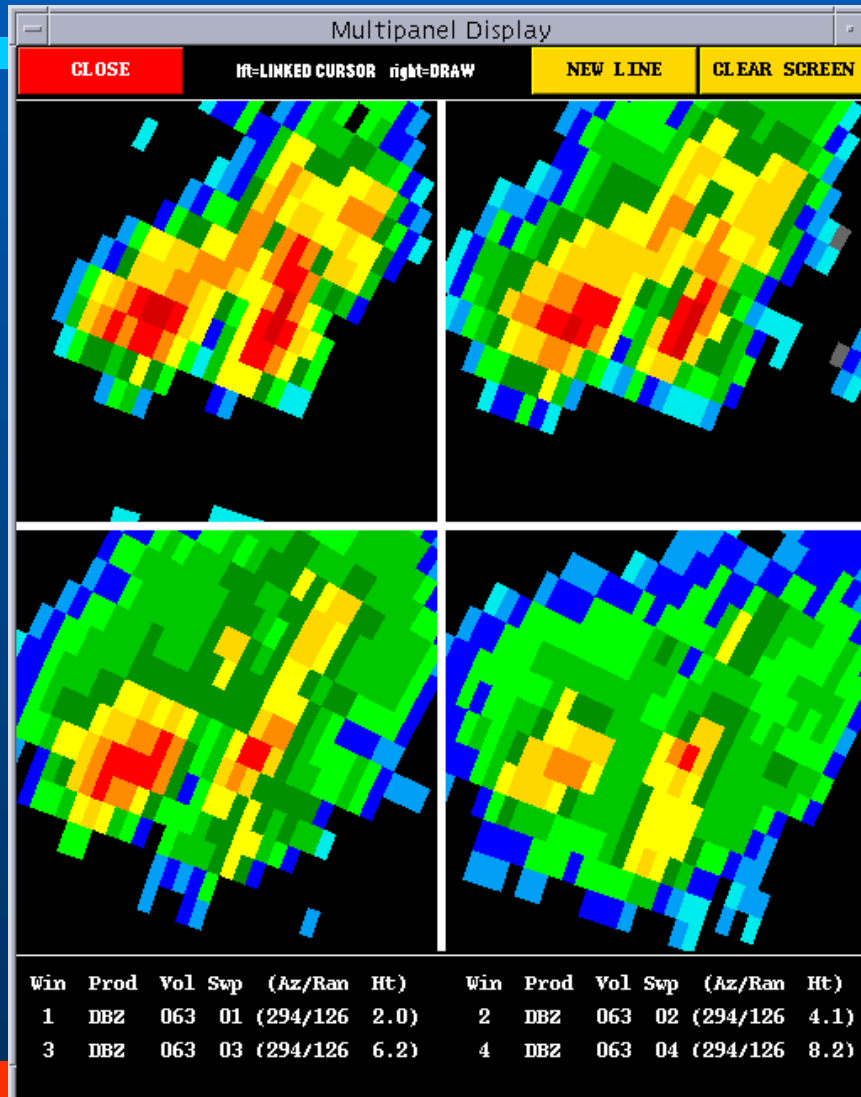
KTLX 3 May 1999 - Storm A



KTLX 3 May 1999 - Storm A

Elev	3D #1	3D #2	Common
0.5	55		
1.5	55		
2.4	50		
3.3	50	45	40
4.3	50	50	45
5.3	50	50	45
6.2	50	50	45
7.5		50	
8.7		55	
10		50	
12		50	
14		45	

KIWA 14 Aug 1996 - Distinct cells



KIWA 14 Aug 1996 - Distinct cells

Elev	Cell #1	Cell #2	Common
0.5	50	50	35
1.5	45	45	35
2.4	40	40	
3.3	40	40	
4.3	30		

Enhanced SCIT

- **Allows merging of 3D detections to occur without a vertical gap**
- **Includes safeguards so that distinct cells in close proximity are not merged**

New vertical-merge technique

- First, merge 3D detections that have a vertical gap
- Then, attempt to merge 3D detections that overlap vertically
- Determine the reflectivity level that 2D components at the same elevation angle have in common

New vertical-merge technique

- Calculate the difference between the common dBZ level and the stronger 2D component
- If the reflectivity difference is ≤ 10 dbZ for 40% or more of the overlapping elevation angles, then merge the 3D detections
- New 3D detection retains the stronger of the two 2D components at the same elevation angle

Test cases

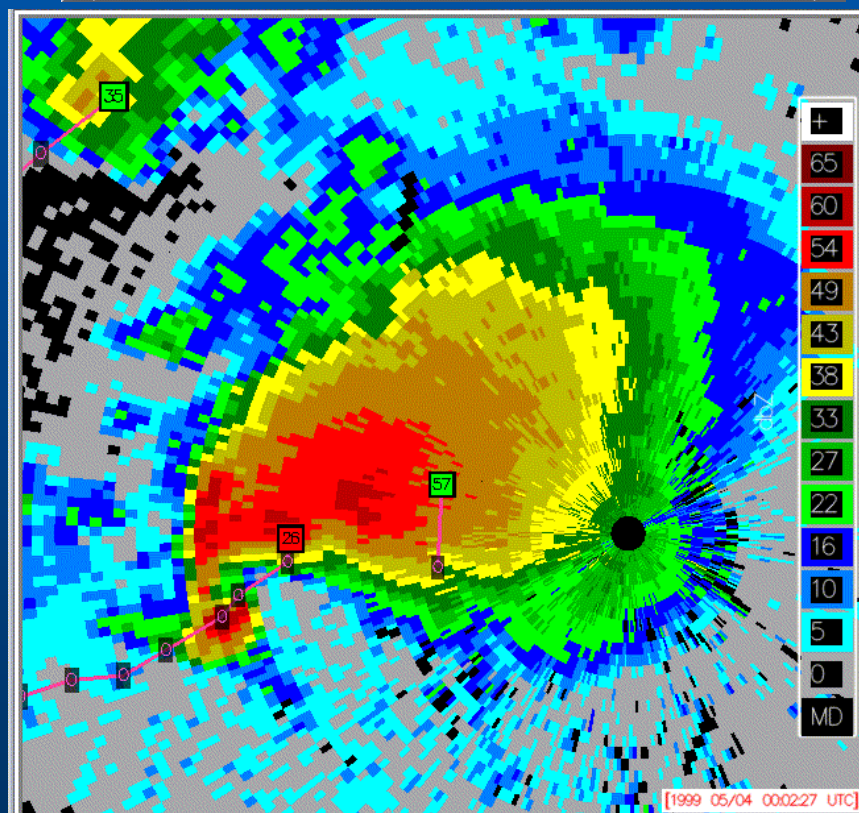
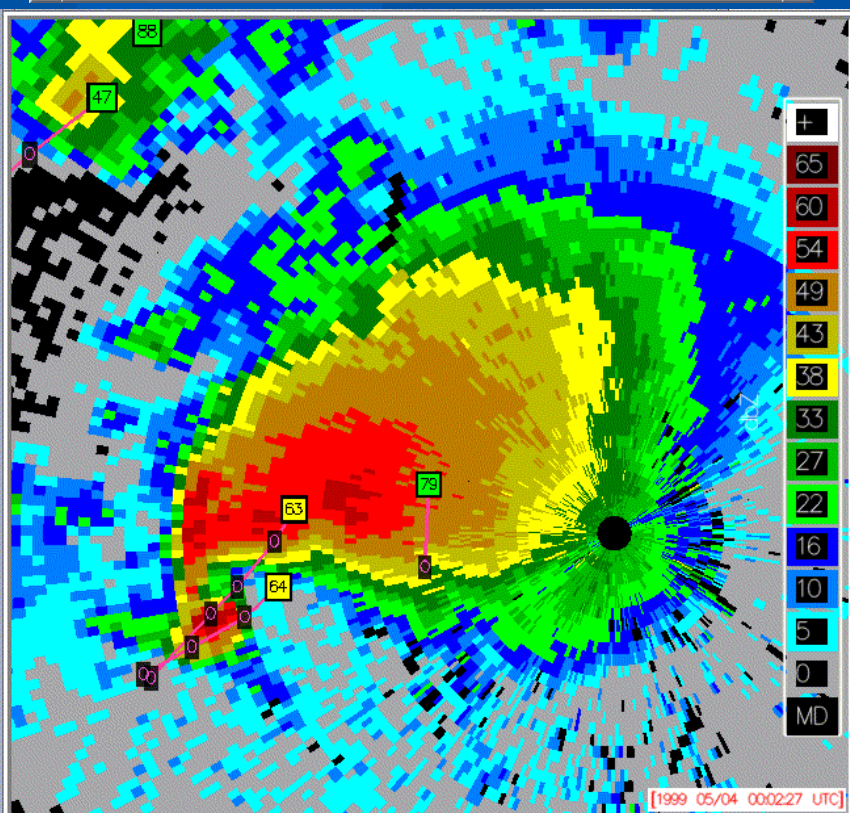
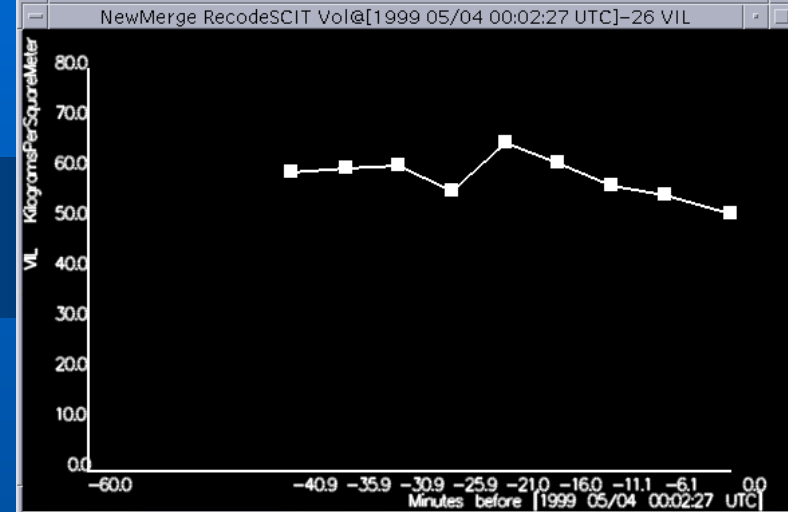
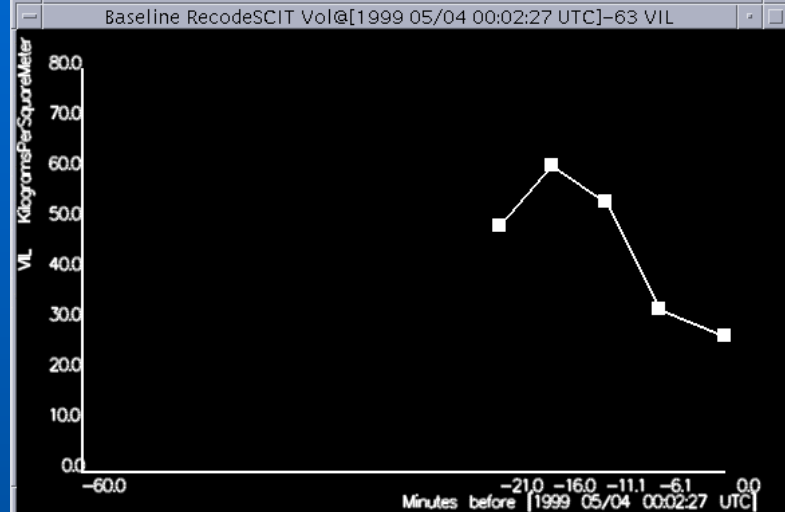
- Warm-season/supercell: 3 May 1999 KTLX
- Squall-line: 15 April 1994 KLSX
- Southwest-monsoon: 14 August 1996 KIWA
- Warm-season/MCS: 22 June 1996 KDTX
- Hurricane Opal: 4 October 1995 KEVX

Vertical-association failures

Case	Volumes	Baseline (#, rate)	New-merge (#, rate)
KTLX 5/3/99	76	20, 26%	8, 11%
KIWA 8/15/96	196	48, 24%	41, 21%
KLSX 04/15/94	199	33, 17%	25, 13%
KDTX 6/22/96	115	45, 39%	33, 29%
KEVX 10/4/95	83	14, 17%	10, 12%
Totals	669	160, 24%	117, 17%
Average failure rate (per case)		25%	17%

Tracking errors

Case	# Storms, Volumes	Baseline (#, rate)	New-merge (#, rate)
KTLX 5/3/99	4, 70	14, 20%	5, 7%
KIWA 8/15/96	27, 158	28, 18%	16, 10%
KLSX 4/15/94	30, 154	40, 26%	23, 15%
KDTX 6/22/96	10, 105	21, 20%	8, 8%
KEVX 10/4/95	13, 68	44, 65%	23, 34%
Totals	84, 555	147, 26%	75, 14%
Average error rate (per case)		30%	15%



Status of the enhanced SCIT

- Integrated into an off-line version of ORPG
- Source code delivered to the ROC